

What do I think about machines that think?

John Mather, Jan. 5, 2015

I think machines that think are evolving just as Darwin told us about the living (and thinking) biological species, through competition, combat, cooperation, survival, and reproduction. The machines are getting more interesting as they get control and sensing of physical things, either directly or through human agents. So far we have found no law of nature forbidding true general artificial intelligence, so I think it will happen, and fairly soon, given the trillions of dollars worldwide being invested in electronic hardware, and the trillions of dollars of potential business available for the winners. Experts say we don't understand intelligence enough to build it, and I agree; but a set of 46 chromosomes doesn't understand it either, and nevertheless directs the formation of the necessary self-programming wetware. Other experts say Moore's law will come to an end soon and we won't be able to afford the hardware; they might be right for a while, but time is long. So I conclude that we are already supporting the evolution of powerful artificial intelligence and it will be in the service of the usual powerful forces: business, entertainment, medicine, international security and warfare, the quest for power at all levels, crime, transportation, mining, manufacturing, shopping, sex, anything you like.

I don't think we're all going to like the results. They could happen very fast, so fast that great empires fall and others grow to replace them, without much time for people to adjust their lives to the new reality. I don't know who would be smart enough and imaginative enough to keep the genie under control, because it's not just machines we might need to control, it's the unlimited opportunity (and payoff) for human-directed mischief. What happens when smart robots can do the many chores of daily life for us? Who will build them, who will own them, and who won't have a job anymore? Will they be limited to the developed world, or will they start a high-tech commercial invasion of the rest of the world? Could they become cheap enough to displace every farmer from his or her field? Will individual machines have distinct personalities, so we have to plan where we send them

to elementary school, high school, and college? Will they compete with each other for employment? Will they become the ultimate hyper-social predator, replacing humans and making us second-class citizens or less? Will they care about the environment? Will they have or be given or develop a sense of responsibility? There's no guarantee they will follow Asimov's three laws of robotics.

On the other hand, as a scientist, I'm eager to see the application of machine thought to exploring new sciences and new technologies. The advantages for space exploration are obvious: machines we build don't have to breathe, and they can withstand extreme temperatures and radiation environments. So they can inhabit Mars more easily than we can, they can travel to the outer solar system with more capability to respond than our current robotic missions, and eventually they could travel to the stars, if they want to. And similarly for under water - we already have heavy industry on the bottom of the ocean, drilling for oil; the seabed is still almost unknown to us, and the value of submerged mineral and energy resources is incalculable. Someday we might have robot wars under the ocean.

Machines that think might be like us, with a desire to explore, or they might not be - why would I or a robot travel for thousands of years through the darkness of space to another star, out of contact with my/its companions, and with little hope of rescue if things go wrong? Some of us would, some of us wouldn't. Perhaps the machines that think will be a lot like the biological machines that think. It's going to be a wild ride, far beyond our best and worst imaginations. Barring warp drive, it may be the only possible way to a galactic-scale civilization, and we might be the only ones here in the Milky Way capable of making it happen. But we might not survive the encounter with alien intelligences we create.